

**UNITED STATES OF AMERICA  
BEFORE THE  
DEPARTMENT OF ENERGY  
OFFICE OF ELECTRICITY DELIVERY AND ENERGY RELIABILITY**

**Energy Policy Act of 2005, Section 1234    )  
Economic Dispatch Study                    )**

**Comments Of  
American Transmission Company LLC**

The Department of Energy, Office of Electricity Delivery and Energy Reliability, (DOE) posed a series of questions in a letter dated September 1, 2005. American Transmission Company LLC, by its corporate manger, ATC Management Inc., (Collectively ATCLLC) files the following responses to the questions related to economic dispatch as defined by Section 1234 of the Energy Policy Act of 2005<sup>1</sup>.

**Executive Summary**

ATCLLC is a stand-alone transmission company (SATC) that does not own generating or distribution facilities. ATCLLC owns approximately 8,900 miles of transmission lines in the states of Wisconsin, Illinois, and the Upper Peninsula of Michigan.

ATCLLC, as a SATC, must design and build a transmission system to meet the transmission service requirements of the transmission customers and to accommodate the power flows administrated by the Midwest Independent Transmission System Operator, Inc. (Midwest ISO), the regional transmission organization (RTO) recognized

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<sup>1</sup> The definition for economic dispatch in the Energy Policy Act of 2005, Section 1234 is "The term 'economic dispatch' when used in this section means the operation of generation facilities to produce energy at the lowest cost to reliably serve consumers, recognizing any operational limits of generation and transmission facilities." This definition of economic dispatch used in the Energy Policy Act is broad enough to encompass the consideration of security constraints. ATCLLC will use "economic dispatch" throughout its comments as synonymous to "security-constrained economic dispatch."

by the Federal Energy Regulatory Commission (FERC) as the RTO for a combined transmission system with a peak demand of 119,000 MWs.

On April 1, 2005, the Midwest ISO implemented a centrally dispatched, security-constrained Day 2 market (Day 2 market) and thus expanded its administrative responsibilities to include the transmission of power throughout the Midwest ISO region, a market for day-ahead power purchases and sales and real-time power transactions, and the dispatching of the generating facilities within its region<sup>2</sup>. The impact of the Midwest ISO using Security-Constrained Economic Dispatch (SCED), “economic dispatch” for purposes of these comments, to dispatch generating facilities and to administer power flows in the Midwest region and the corresponding impact on reliability is of great interest to ATCLLC.

With the advent of the Day 2 market in the Midwest ISO region, there has been a dramatic change in the flow of power across the ATCLLC system as compared to what ATCLLC had experienced prior to this time. To continue to provide reliable transmission service, ATCLLC must address these power flow changes in its planning process. In addition to creating a Day 2 market, the Midwest ISO has been directed to develop a joint and common market with PJM Interconnection LLC, which will expand the geographic area of the market and likely change the power flow patterns. ATCLLC will have to remain flexible to be able to plan for another potentially dramatic shift in conventional power flow patterns.

As expanding the use of centralized economic dispatch over a broader footprint has an impact on power flows, any changes that are made to economic dispatch

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<sup>2</sup> Prior to the Day 2 Market, the generating facilities interconnected to the transmission system comprising the Midwest ISO region were dispatched by the various Control Area Operators or other entities that owned such generating facilities, who in turn requested transmission service that may or may not have been available, depending on the transmission system configuration and the constraints that existed on the transmission system at any moment in time.

procedures must ensure that the reliability of the transmission system is maintained or improved. ATCLLC believes that any suggested changes incorporate the following:

**Modification 1: Sharing of reliability-related information should be enhanced amongst Reliability Entities (i.e., RTOs, ISOs, Transmission Owner/Operators, Balancing Authorities, etc.)**

**Modification 2: Short-term must-run generating requirements should be incorporated into the economic dispatch process.**

**Modification 3: Model-building coordination among the Reliability Entities should be improved.**

**Modification 4: The scope of the DOE study on the benefits of economic dispatch should be modified or clarified to more specifically include consideration of unit commitment for reliability purposes.**

**Modification 5: Load forecasting accuracy should be improved.**

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#### Description ATCLLC

ATCLLC is a transmission owner and participant in the Midwest ISO Regional Transmission Organization. ATCLLC is a stand-alone, for-profit transmission company

that owns, maintains, and operates approximately 8,900 miles of transmission lines and related transmission facilities in the states of Wisconsin, Michigan and Illinois.

### Comments

Section 1234 of the Energy Policy Act of 2005 requires the DOE to conduct a study on the benefits of economic dispatch in the electricity industry, in order to identify:

- Procedures currently used to perform economic dispatch
- Revisions to those procedures to improve the ability of non-utility generation resources to offer their output for sale
- The potential benefits to electricity consumers if economic dispatch procedures were revised to improve the ability of non-utility generation resources to offer their output for sale

The Office of Electricity Delivery and Energy Reliability issued a letter dated September 1, 2005, requesting comments on six economic dispatch-related questions.

The majority of the questions relate to the role non-utility generation resources could play in economic dispatch. The ATCLLC comments will focus on the important reliability-related aspect of economic dispatch. ATCLLC encourages the DOE to not simply focus on the inclusion of non-utility generation into an economic dispatch mechanism, but to consider the reliability-related aspects of such modifications, as well. Specifically, ATCLLC believes the DOE should collect and organize the available economic dispatch procedures and analyses, but any suggested legislative or regulatory changes or improvements made to Congress and the states should ensure that the reliability of the transmission system is maintained or improved. ATCLLC believes that any suggestions should reflect the following reliability-based changes:

**Modification 1: Sharing of reliability-related information should be enhanced amongst Reliability Entities (i.e., RTOs, ISOs, Transmission Owner/Operators, Balancing Authorities, etc.)**

**Modification 2: Short-term must-run generating requirements should be incorporated into the economic dispatch process.**

**Modification 3: Model-building coordination among the Reliability Entities should be improved.**

**Modification 4: The scope of the DOE study on the benefits of economic dispatch process should be modified or clarified to more specifically include consideration of unit commitment for reliability purposes.**

**Modification 5: Load forecasting accuracy should be improved.**

The direction provided by the DOE is:

Section 1234 of the Energy Policy Act defines economic dispatch as “the operation of generation facilities to produce energy at the lowest cost to reliably serve customers, recognizing any operational limits of generation and transmission facilities.” With that definition in mind, please answer as many of the following questions as you wish, attaching supporting materials such as studies or testimony that was filed in state or federal regulatory proceedings to support your answer.<sup>3</sup>

Below are the ATCLLC responses to the identified questions.

Question 1)

What are the procedures now used in your region for economic dispatch? Who is performing the dispatch (a utility, an ISO or RTO, or other) and over how large an area (geographic scope, MW load, MW generation resources, number of retail customers within the dispatch area)?

Response to Question 1)

The Midwest ISO uses economic dispatch to dispatch 131,000 MWs of installed generating capacity and communicates to the Balancing Authorities every five minutes the output requirements for each generating unit within the Midwest ISO region to be scheduled to meet the current region-wide demand. Balancing Authorities are responsible for balancing the demand and production of power, as well as accounting for the differences within their respective balancing areas.

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<sup>3</sup> DOE Letter dated September 1, 2005.

As the RTO for the Midwest region, the Midwest ISO is responsible for the operational reliability and the security of the transmission system. The Midwest ISO is also responsible for providing information to Market Participants<sup>4</sup> including Locational Marginal Prices for transactions in the Day 2 market.

The Midwest ISO is a non-profit organization, which was founded in 1998, and is governed by an independent Board of Directors. The Midwest ISO is headquartered in Carmel, Indiana with an operations center in St. Paul, Minnesota. The Midwest ISO members represent 15 states and the province of Manitoba. The Midwest ISO operates a system that consists of 97,000 miles of transmission lines with a peak load of 119,000 MWs and 131,000 MWs of generation capacity.

Question 2)

Is the Act's definition of economic dispatch (see above) appropriate? Over what geographic scale or area should economic dispatch be practiced? Besides cost and reliability, are there any other factors or considerations that should be considered in economic dispatch, and why?

Response to Question 2)

It is not clear from the definition of economic dispatch provided in the Energy Policy Act whether it includes consideration of unit commitment. As unit commitment rules play a major role in determining whether the right mix of generation is on line and therefore available "to produce energy at the lowest cost to reliably serve customers," ATCLLC's reliability comments regarding economic dispatch consider the corollary of unit commitment.

The geographical size of the RTO impacts the interregional transfers - the larger the size, the larger the potential for interregional transfers. This is not a concern from a reliability perspective as long as the economic dispatch rules appropriately recognize the

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<sup>4</sup> The term "Market Participant" is a term defined in the Midwest ISO Open Access Transmission and Energy Market Tariff (TEMT) and generally refers to those that transmit energy, as well as those that purchase or sell power in the Day 2 Market.

need to commit local generation and the need for proactive coordination amongst Reliability Entities. Generation commitment based upon day-ahead models, however, has the potential to degrade reliability if the day-ahead models are unable to accurately predict the potential for large or changing interregional transfers.

Question 3)

How do economic dispatch procedures differ for different classes of generation, including utility-owned versus non-utility generation? Do actual operational practices differ from the formal procedures required under tariff or federal or state rules, or from the economic dispatch definition above? If there is a difference, please indicate what the difference is, how often this occurs, and its impacts upon non-utility generation and upon retail electricity users. If you have specific analyses or studies that document your position, please provide them.

Response to Question 3)

Economic dispatch procedures in the ATCLLC portion of the Midwest ISO are the procedures in place at the Midwest ISO, the Market Operator for the Midwest market.

Under the Midwest market, economic dispatch procedures do not differ based upon ownership and therefore provide a level playing field among utility-owned and non-utility owned generators. ATCLLC views this as one benefit of having an independent Market Operator as it encourages the widespread participation of generators in the market.

Question 4)

What changes in economic dispatch procedures would lead to more non-utility generator dispatch? If you think that changes are needed to current economic dispatch procedures in your area to better enable economic dispatch participation by non-utility generators, please explain the changes you recommend.

Response to Question 4)

In ATCLLC's understanding of the Day 2 Market, the Midwest ISO does not differentiate between generating units based on their respective ownership; as a result, the Day 2 Market would appear neutral in encouraging the participation of non-utility generators (NUGs). Changes that would increase the number of Market Participants, primarily of small generation entities, include the development of a simplified Market Participant model that would make it easier for small entities to participate. From ATCLLC's perspective, the existing processes and procedures for offering generation

into the market, as well as managing the settlement and billing process appear burdensome for smaller entities that do not have sufficient staff to actively monitor the market, respond to changes in market conditions, and manage the settlement functions.

Given that the Independent Market Monitor (IMM) of the Midwest ISO, Potomac Economics LLC, has determined and the FERC has designated ATCLLC's portion of the Midwest ISO as a Narrow Constrained Area (NCA) under the Midwest ISO Tariff<sup>5</sup>, the participation of smaller entities in the economic dispatch process would increase the number of generators available to relieve transmission constraints and improve system reliability in real time.

#### Question 5)

If economic dispatch causes greater dispatch and use of non-utility generation, what effects might this have – on the grid, on the mix of energy and capacity available to retail customers, to energy prices and costs, to environmental emissions, or other impacts? How would this affect retail customers in particular states or nationwide? If you have specific analyses to support your position, please provide them to us.

#### Response to Question 5)

In general, ATCLLC supports the greater dispatch and use of non-utility generation. As mentioned previously, ATCLLC has been identified as a NCA; and the more generation that is available for use in performing economic dispatch, the greater the portfolio of generators available to relieve transmission constraints and improve reliability in real time.

#### Question 6)

Could there be any implications for grid reliability – positive or negative – from greater use of economic dispatch? If so, how should economic dispatch be modified or enhanced to protect reliability?

#### Response to Question 6)

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<sup>5</sup> The definition of NCA from the TEMT page 102 is "An electrical area that has been identified by the IMM that is defined by one or more Binding Transmission Constraints that are expected to be binding for at least five hundred (500) hours during a given year and within which one or more suppliers are pivotal."



A positive implication from the greater use of economic dispatch is increased operating flexibility as a means to manage real-time overloads. Second, greater use of properly coordinated economic dispatch should lead to a decrease in the number of seams issues. Third, greater use of economic dispatch has allowed ATCLLC to utilize new tools in analyzing future transmission investments and their associated benefits to the grid on a broader geographic basis. Planned investments in transmission facilities need to be positioned such that new facilities support emerging market patterns and flows. For example, the “Access Initiative Study” conducted by ATCLLC utilized the PROMOD® application to quantify some of the potential benefits of adding new transmission facilities in the year 2013.

A negative implication from greater use of economic dispatch is that it may degrade grid reliability over the long term. If economic dispatch is applied to long-term expansion planning studies as the primary method of managing projected overloads, it may become an impediment to necessary grid expansion.

Economic dispatch in real time or on a short-term basis is of great value. Use of economic dispatch, however, on a long-term basis to address projected transmission overloads ensures that the capacity decremented to achieve the overload relief is then unavailable to subsequent system-wide capacity requirements.

Consideration should be given to improving communication and coordination amongst Reliability Entities and limiting the extent to which economic dispatch is applied to long-term expansion planning studies to ensure that overall reliance on economic dispatch to manage grid reliability does not become too great. ATCLLC believes that an appropriate balance between economic dispatch and investment in grid expansion and new generation siting should be established to promote grid reliability.

Since the process of unit commitment determines the universe of units that should be available as part of the real-time economic dispatch process, the concepts of unit commitment and economic dispatch are closely linked. Generators that are not committed as part of the day-ahead unit commitment selection process may choose to sell their output elsewhere or remain off line in real time and may not be available or their availability may be delayed to relieve real-time constraints. This has the potential to lead to reliability concerns, particularly when insufficient generation capacity is committed to supply the load. At times this happens when the load forecast predicts the load to be lower than what actually materializes under real-time conditions.

To protect reliability, economic dispatch should be modified or enhanced such that:

- Sharing of reliability information should be enhanced amongst Reliability Entities to allow Reliability Entities to improve coordination in operating their respective systems.<sup>6</sup>
- Short-term must-run requirements should be incorporated into the economic dispatch process.
- To maintain reliability, centrally dispatched markets require enhanced coordination and communication to support dynamic flow patterns. Since a greater use of economic dispatch has the potential to change traditional power flow patterns, model-building coordination among the Reliability Entities should be improved. For example, economic dispatch over a wide geographic area can

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<sup>6</sup> Concern for confidentiality among Market Participants currently limits the amount of information available to non-Market Participant functions concerned with maintaining system reliability. Without sufficient data relative to predicted (day ahead) and real-time conditions, Transmission Operators, such as ATCLLC, have a more difficult time in performing their reliability studies to determine and anticipate transmission system contingencies on the ATCLLC transmission system.

create large transfers, which could result in unexpected constraints. The process to predict transmission constraints could be enhanced if the accuracy of the available information was improved and then utilized to develop day-ahead (or longer-term) models. In addition, unanticipated dispatch of generation may alter reactive power flows leading to reliability concerns. The process to maintain sufficient reactive power support on the transmission system could be enhanced by improving communication of unit dispatch information. These improvements in information and the models should increase the effectiveness of the economic dispatch.

- A review of economic dispatch would not be complete without considering the impact of unit commitment on the results of economic dispatch. Economic dispatch procedures provide the best solution in real time based upon the units that are available to relieve congestion. Economic dispatch is limited in providing the best solution to the extent that, if a generator has not been selected as part of the unit commitment process (and is unavailable in real time), it may not be available or its availability delayed to relieve a constraint when needed.
- The extent that real-time loads deviate from the forecasted day-ahead loads drives the concern of sufficient generation needed to respond to these deviations. Improving the accuracy of load forecasting is critical from a system reliability perspective.

### Conclusion

DOE can play an important role in ensuring that expanded use of economic dispatch will maintain or improve the reliability of the transmission system by implementing five key modifications. As these modifications are undertaken, it is important that the information collection and information utilization efforts result in an

improved and consistently-applied economic dispatch, while ensuring that the security of the data and the analysis is not compromised.

Respectfully submitted this 21st of September, 2005.

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By its corporate manager, ATC Management Inc.

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